

PHYSICS NMDCAT

TOPIC WISE TEST (UNIT-11)

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SAEED MDCAT TEAM

TOPICS:

✓ Atomic Spectra

- Q. 1 With the increase in quantum number the energy difference between consecutive energy levels
A. Remains constant B. Decreases
C. Increases D. Sometimes increases sometimes decreases
- Q. 2 Which of following is true for characteristics of X-rays?
A. Their energy depends upon accelerating voltage
B. The photon of λ_{\min} belongs to them
C. Their speed depends upon target material
D. Their intensity depends upon filament current
- Q. 3 The wavelength of continues x-rays is proportional to
A. Intensity of incident electron beam
B. Temperature of the target
C. Filament current
D. Inversely to the energy of electron striking the target
- Q. 4 In the x-ray tube, electrons of high energy E are incident on a target of tungsten. Which of the following three statements are correct?
1- All the energy is converted to X-rays.
2- The maximum X-ray frequency obtained is E/h.
3- The X-rays are diffracted by the tungsten metal.
A. 1,2,3 are all correct B. Only 2,3
C. Only 1,2 D. 2 only
- Q. 5 Which of the following characteristic X-rays has greatest intensity?
A. K_{α} B. K_{β}
C. K_{γ} D. All have same
- Q. 6 An electron accelerated through a potential difference 50000 volts will gain kinetic energy of
A. 50 V B. 50 KeV
C. 5000V D. 50000 KV
- Q. 7 Energy order of characteristics x-rays
A. $K_{\gamma} > K_{\beta} > K_{\alpha}$ B. $K_{\gamma} < K_{\beta} < K_{\alpha}$
C. $K_{\gamma} = K_{\beta} = K_{\alpha}$ D. $K_{\gamma} > K_{\beta} < K_{\alpha}$
- Q. 8 In Coolidge tube target have the following properties
A. High atomic number B. High melting point
C. Low atomic number and melting points D. Both "A" and "C"
- Q. 9 The maximum wavelength of Lyman series is.....
A. $\frac{4}{3R}$ B. $\frac{1}{R^2}$
C. $\frac{C}{R}$ D. $\frac{1}{RC}$
- Q. 10 An atom is excited to an energy level E_1 from its ground state energy level E_0 . The wavelength of the radiation emitted is



A. $(E_0 - E_1)/hc$

B. $\frac{E_1}{hc} - \frac{E_0}{hc}$

C. $(E_1 - E_0)/h$

D. $\frac{hc}{(E_1 - E_0)}$

Q. 11 X-rays are not used in RADAR, because

A. X-rays are not reflected by target

B. X-rays damage the target.

C. X-rays are completely absorbed by air

D. All of these

Q. 12 If Accelerating electron in the first interaction loses all of its energy in the target material, then emitted x-rays photon has wavelength

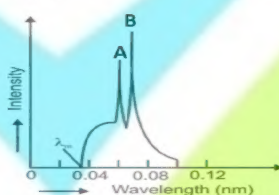
A. eV

B. hc/eV

C. eV/hc

D. None

Q. 13 The figure represents the observed intensity of X-rays emitted by an X-ray tube as a function of wavelength. The sharp peaks A and B denote



A. Band spectrum

B. Continuous spectrum

C. Characteristic radiations

D. White radiations

Q. 14 The Balmer series for hydrogen atom corresponds to electronic transitions that terminate in the state of quantum number $n = 2$. The longest wavelength of photon emitted is

A. $\frac{5R}{36}$

B. $\frac{36}{5R}$

C. $\frac{36}{5}$

D. $\frac{5}{36}$

Q. 15 Which of the transitions in hydrogen atom emits a photon of lowest frequency ($n =$ quantum number)

A. $n = 2$ to $n = 1$

B. $n = 4$ to $n = 3$

C. $n = 3$ to $n = 1$

D. $n = 4$ to $n = 2$

Q. 16 Shortest wavelength photon in the Balmer series is

A. $\frac{4}{R}$

B. $\frac{R}{4}$

C. $\frac{1}{4}$

D. 4

Q. 17 The Balmer series is found in the spectrum of

A. Hydrogen

B. Oxygen

C. Nitrogen

D. All

Q. 18 Spectroscopy is a branch of physics which deals with the study of _____ of electromagnetic radiation

A. Emission

B. Absorption

C. Wavelength

D. All of these

Q. 19 The experimental value of Rydberg constant is

A. $1.097 \times 10^{-8} \text{ m}^{-1}$

B. $1.097 \times 10^7 \text{ m}^{-1}$

C. $1.097 \times 10^8 \text{ m}^{-1}$

D. $1.097 \times 10^{-7} \text{ m}^{-1}$

Q. 20 The wavelength of last spectral line in Lyman series (in of Rydberg constant) is

A. R

B. R^2

C. $\frac{1}{R}$

D. $\frac{1}{R^2}$

Q. 21 Balmer series was identified in:

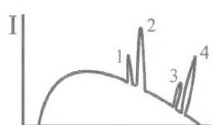
A. 1685

B. 1985



- C. 1785 D. 1885
- Q. 22** Balmer series lies in that region of electromagnetic wave spectrum, which is known as:
- A. Visible region B. Ultraviolet region
C. Invisible region D. Infra-red region
- Q. 23** Tick the series lies in infra-red region:
- A. Paschen series B. Pfund series
C. Brackett series D. All of the above
- Q. 24** In the general formula in which all the series of hydrogen spectrum is given by:
- A. $\lambda = R_H \left(\frac{1}{p^2} - \frac{1}{n^2} \right)$ B. $\lambda = \frac{1}{R_H} \left(\frac{1}{p^2} - \frac{1}{n^2} \right)$
C. $\frac{1}{\lambda} = R_H \left(\frac{1}{p^2} - \frac{1}{n^2} \right)$ D. $\lambda = R_H \left(\frac{1}{p^2} - \frac{1}{n^2} \right)$
- Q. 25** During the transition of Electron of Hydrogen atom from higher orbit to a third orbit, a photon of:
- A. Paschen series is emitted B. Lyman series is emitted
C. Balmer series is emitted D. Brackett series is emitted
- Q. 26** The radiations emitted from hydrogen filled discharge tube shows:
- A. Continuous spectrum B. Band spectrum
C. Line spectrum D. None of these
- Q. 27** Find the minimum wavelength of X-ray produced if 10 kV potential difference is applied across the anode and cathode of the tube.
- A. 12.4 Å B. 12.4 nm
C. 1.24 nm D. 1.24 Å
- Q. 28** Who discovered X-ray?
- A. Roentgen B. Marie curie
C. Rutherford D. All
- Q. 29** For harder X-rays
- A. Wavelength is higher B. Intensity is higher
C. Frequency is higher D. All of these
- Q. 30** If the current in the circuit for heating the filament is increased, the cutoff wavelength
- A. Will increase B. Will decrease
C. Will remain unchanged D. Will change
- Q. 31** The X-ray beam coming from an X-ray tube
- A. Is monochromatic
B. Has all wavelengths smaller than a certain maximum wavelength
C. Has all wavelengths greater than a certain minimum wavelength
D. Has all wavelengths lying between minimum and a maximum wavelength
- Q. 32** What is the effect of electric and magnetic fields on X-rays?
- A. X-rays are deflected
B. X-rays are not deflected
C. X-rays are sometimes deflected and sometimes not
D. Nothing can be said
- Q. 33** Hydrogen atom does not emit X-rays because
- A. Its energy levels are very close to each other
B. The energy levels are far apart from each other
C. Its size is very small
D. It contains only single electron
- Q. 34** In heavy atoms, the inner shell transitions give rise to
- A. UV light B. Visible light
C. X-rays D. γ-rays
- Q. 35** If the distance between anode and cathode is doubled and target potential is reduced to half. Then energy of continuous x-rays becomes
- A. Double B. Half C. Remain same D. Four times
- Q. 36** According to the following graph identify the correct option:

Peak	1	2	3	4
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A.	X-ray photon	K_{α}	K_{β}	L_{α}	L_{β}
B.	X-ray photon	L_{α}	L_{β}	K_{α}	K_{β}
C.	X-ray photon	L_{β}	L_{α}	K_{β}	K_{α}
D.	X-ray photon	K_{β}	K_{α}	L_{β}	L_{α}

- Q. 37** The most energetic photon in a continuous X-ray spectrum has an energy approximately equal to:
- The energy of all the electrons in a target atom
 - The rest energy, mc^2 , of an electron
 - The kinetic energy of an incident-beam electron
 - The kinetic energy of a K-electron in the target atom
- Q. 38** The penetrating power of X-rays depends on their _____
- Applied voltage
 - Filament current
 - Source
 - All of the above
- Q. 39** Which of the following shows the best relation between wavelength and intensity?
- Intensity

A.

B.
- C.

D.
- Q. 40** The minimum wavelength of X-rays can further be reduced by _____
- Reducing the pressure or cooling the target.
 - Increasing the temperature of the filament.
 - Using a target element of higher atomic number.
 - Increasing the potential difference between the cathode and the target
- Q. 41** K_{β} - characteristic X-rays are produced due to the transition of electrons
- From L-shell
 - From M-shell to L-shell
 - From M-shell to K-shell
 - From N-shell to K-shell
- Q. 42** Radiation with wavelength longer than red light _____
- Ultraviolet rays
 - X-rays
 - Infrared radiation
 - Visible radiation
- Q. 43** In an X-rays tube, the intensity of the emitted X-rays beam is increased by
- Increasing the target potential
 - Decreasing the filament current.
 - Increasing the filament current
 - Decreasing the target potential.
- Q. 44** The target in an X-rays tube is given a
- Zero potential
 - Low negative
 - High positive potential
 - High negative potential
- Q. 45** In the X-ray tube before striking the target we accelerate the electrons through a potential difference of V volt. For which of the following value of V, we will have X-rays of largest wavelength?
- 10 kV
 - 20 kV
 - 30 kV
 - 40 kV
- Q. 46** Mosley's law relates the frequencies of line X-rays with the following characteristics of the target element
- Its density
 - Its atomic weight
 - Its atomic number
 - Inter planer spacing of the atomic planes

B. $\frac{3}{16} \times 10^{15}$

D. $\frac{3}{4} \times 10^{15}$

D. Lyman series



Q. 49 The ratio of the frequencies of the long wavelength limits of Lyman and Balmer series of hydrogen spectrum is

A. 27 : 5
C. 4 : 1

Q. 50 If an electron jumps from 1st orbital to 3rd orbital, then it will.

A. Absorb energy
C. No gain of energy

B. 5 : 27
D. 1 : 4

B. Release energy
D. None of these

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Phy T-11

Physics Unit #1

01-B	11-A	21-D	31-D	41-B
02-D(d)	12-B	22-A	32-B	42-C
03-D	13-C	23-D	33-A	43-C
04-B	14-B	24-C	34-C	44-C
05-A	15-B	25-A	35-C	45-A
06-B	16-A	26-C	36-D	46-C
07-A	17-A	27-D	37-C	47-C
08-D	18-D	28-A	38-A	48-D
09-A	19-B	29-C	39-C	49-A
10-D	20-C	30-C	40-D	50-A

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